

Impact of the “Summer Immersion” Programs for first year STEM students at HSU

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Abstract

HSU’s Place-Based Learning Communities engage first-year STEM students in 3- or 4-day Summer Immersion programs immediately prior to the start of the fall semester. The programs are designed to welcome students to the region, introduce them to the local environment and communities, and engage them in relevant scientific work. Student surveys conducted in early fall 2018 following Summer Immersion showed that, compared to non-participating students, students participating in a Summer Immersion self-reported a stronger sense of belonging, increased connection to faculty and peers, higher sense of self-efficacy and motivation, and a stronger sense of community.



Survey Instrument

A Likert-scale (1-5) survey instrument was developed with 25 questions designed to assess five factors associated with a favorable transition to the university: sense of belonging; connection to peers and faculty; self-efficacy, motivation & engagement in science; and welcoming & community. The survey was open to all STEM Freshmen in the third week of Fall 2018, with 210 respondents (47% response rate). Comparisons were made between students who participated in a PBLC Summer Immersion (n=155) and those that did not (n=55), with data disaggregated by the following student groups: student’s underrepresented group (URG), first-generation students, and low income (Pell grant recipients).

Background & Purpose

Cultivating academic integration to a new campus home is especially challenging and important for campuses that attract students of color to locales unlike that of their original home town. Humboldt is unfamiliar to many of its first year students, the majority of which come from large, urban centers elsewhere in California. This unfamiliarity, coupled with the academic and social shocks of engaging in a STEM discipline, can make it challenging for new students to successfully transition to campus. HSU has launched several ‘Place-Based Learning Communities’ (PBLCs) for first year STEM students. Place-based education seeks to connect students to the region of study, provide cultural and/or geographic context to lessons, and usually involves outdoor education methodologies. To better welcome students and cultivate their academic integration, the PBLCs include a 3- or 4-day intensive Summer Immersion program immediately prior to the fall semester.

Summer Immersion – the programming

Students participating in HSU’s Place-Based Learning Communities in 2015-2018 arrived to campus several days before the rest of the first-year students to participate in the Summer Immersion program, then joined the rest of the new students in the standard Freshmen Orientation before the start of fall classes. The Summer Immersion itineraries vary among the PBLCs (see table below for details) but generally share the following common elements:

- 1) **RAMP mentors** engage the new students in ice-breakers and accompany the students throughout the entire Summer Immersion.
- 2) Students receive a **program welcome** from faculty and staff, then participate in **hands-on activities related to their majors** on and off-campus with HSU faculty, local scientists, and tribal collaborators from the Yurok and Wiyot tribes.
- 3) The activities **engage students with science and the local region** to help illustrate the relevance of science to local communities. In many cases, collaborators are alumni, and speak about their own education and career development.
- 4) Students **collect samples and scientific data** during the Summer Immersion, which they revisit in subsequent linked exercises that thread through multiple first-year courses. For example, Klamath Connection students analyze Klamath River water to determine if nitrogen encourages the growth of a toxic blue-green algae (*Microcystis aeruginosa*), which can build up in harmful algal blooms that threaten human health, endanger fish and wildlife, and impose environmental injustices to Indigenous people. By linking content across Botany, Math, and Native American Studies courses, these exercises galvanize the interconnectedness of academic disciplines, environmental protection, and human well-being.

PBLC name	Majors participating in summer 2018 (number of students)	Examples of Summer Immersion Activities
Klamath Connection	Biology, Botany, Zoology, Environmental Science & Management, Forestry, Rangeland Resource Sciences, Wildlife, Fisheries, Environmental Resources Engineering (n=167)	Full-day field trip to the Klamath River; cultural presentations from Yurok Tribe, discipline specific field trips to Arcata Marsh and Wildlife Sanctuary and Blue Lake Rancheria to learn about the local area and resources.
Stars to Rocks	Chemistry, Physics, Geology (n=34)	Visit to Patrick’s Point, Sumeg Village, Eel River, and Table Bluff to meet with members of the Wiyot Tribe.
Rising Tides	Marine Biology & Oceanography (n=44)	Field trips to Trinidad Bay and Humboldt Bay, ride on Coral Sea in Humboldt Bay, Sumeg Village to meet with members of Wiyot Tribe.

STEM Students from Underrepresented Groups

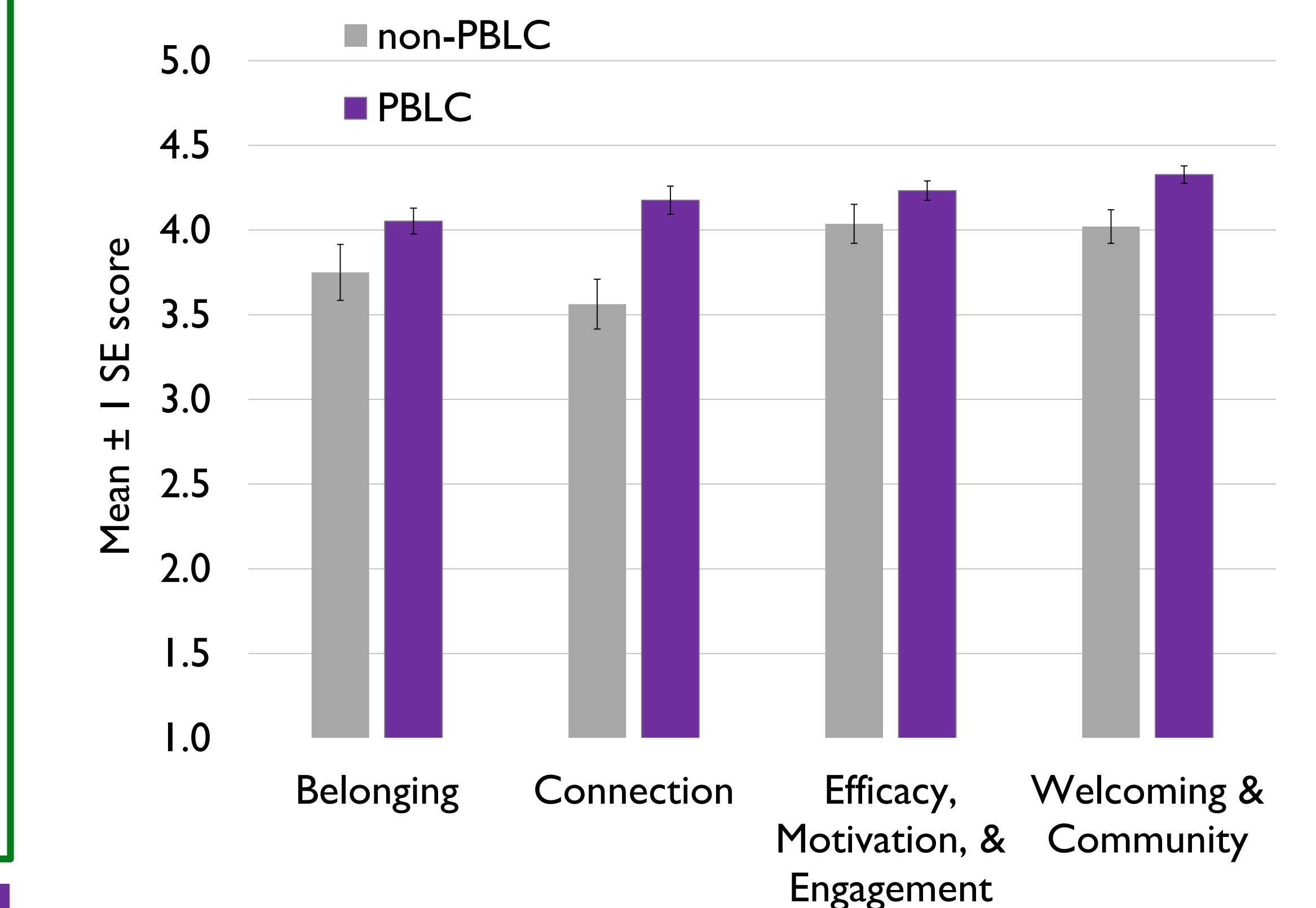


Figure 1. Results of STEM Freshman survey from early fall semester 2018 that compares sense of belong, connection, efficacy, motivation & engagement and welcoming and community between PBLC and non-PBLC students.

Summer Immersion – the intent

The Summer Immersion programs are comprised of activities designed to connect the students to each other, the HSU community, and the region. The programs are designed to deliver **several messages** to support the participating students in their transition to the campus community:

1. Welcome to this exciting and diverse place and this academic community of learners
2. Learning about Humboldt includes learning about and from indigenous communities
3. You are a beginning scientist and scientific content at HSU begins immediately
4. The outdoors are part of your “classroom”
5. Solving complex social and environmental problems requires recognizing the interconnectedness of disciplines and working with others
6. Your peers can help you learn and vice versa
7. You have a range of offices and people – faculty, staff, students – that are here to support you and help you succeed.

Results

Students participating in a Summer Immersion in 2018 self-reported higher scores in all five factors. Means ± one standard error for underrepresented students are shown in Figure 1, but similar results occurred for each student group, and for all students overall. For students that did not participate in a PBLC, there were small gaps between students from underrepresented and non-underrepresented groups (difference in means 0.09-0.23 for the four factors). These gaps were generally smaller for underrepresented and non-underrepresented students that did participate in a PBLC (difference in means 0.04-0.13).

Acknowledgements

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